

Multi User Oral Cleansing Device, DentalJet

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References in U.S. Patent Documents

3,578,884	May 18 1971	Jacobson
3,593,707	July 20, 1968	Pifer
3,690,314	Sept. 12, 1972	Trupp et al
3,973,558	Aug. 10, 1976	Stouffer et al
4,135,501	Jan. 23, 1979	Leunissan
4,265,229	May 5, 1981	Rice at al
4,793,331	Dec. 27, 1988	Stewart
4,941,459	July 17, 1990	Sandip Mathur
4,942,870	July 24, 1990	Damien
5,095,893	March 17, 1992	Rawden Jr.
5,220,914	June 22, 1993	Thompson
5,231,978	Aug.3, 1993	Kao et al
5,385,533	Jan. 31, 1995	Coviello
5,387,182	February 1995	Otani
5,772,616	Jun 30, 1998	Competiello

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BACKGROUND OF THE INVENTION

Field of Invention

This invention generally relates to the field of Dental hygiene in particularly to the ways and means of removing, washing out food particles from oral cavity, from under bridge works, around crowns, plaque from teeth, massaging gums in a user friendly, inexpensive way. This DentalJet is also useful of cleaning dentures, or even jewelry with strong jet flow setting. US patent classification is 128/66, International classification is A61H 9/00.

Most of the attention has been given to the care and preservation of the teeth and gums, and to various types of apparatus employing a jet of water for cleaning the teeth and massaging the gums. Such apparatus are old and well known in the arts and are generally characterized as being structurally complex, most are expensive to manufacture, some are big and bulky, unsightly or inconvenient to use.

Description of Prior Art

This multi user oral cleansing invention overcomes some of these shortcomings of the prior arts and or creates a new way to maintain excellent oral hygiene at low cost at the most convenient way. Patent No 3,593,707 July 20, 1968 Pifer shows a Jet tooth brush combination, uses faucet valves as a main water flow and temperature control, uses too many parts, brush/jet tip is too cumbersome for easy manufacturing, to the best of my knowledge it never made it to public. 3,690,314 Trupp et al uses special diverter / impeller to create pulsating water jet for oral cleaning with a non detachable nozzle for some reason it is not on the market.

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3,973,558 Stouffer et al uses and oscillating jet tip, nozzle / handle seems too long to be for practical use. 4,135,501 Leunissan uses a gripping adapter to the faucet, in most cases it would slip off from the water pressure, or it is just not adaptable to most types of faucets.

4,265,229 Rice at al. describes a simple usable device for shower connection.

4,793,331 Stewart uses a shower type diverter driven dental jet, very similar to the Rice invention. 4,941,459 Sandip Mathur uses a slip on type adapter looks very industrial, crude design, seems it never made it to the market place for this reason. 4,942,870 Damien looks bulky and may be impractical for daily use, not being marketed. 5,095,893 Rawden Jr. seems to be a low cost oral cleaning device, diverter is a pull type, once activated water pressure keeps diverter in diverted position, only water pressure control is the main faucet valve, no secondary fine pressure adjustment is available but it employs a replaceable jet and pulsating impeller.

5,220,914 Thompson's water / antiseptic mixer, installed to the shower head or to cold water line. 5,231,978 Kao et al uses too many parts, faucet adaptation looks very impractical.

5,385,533 Coviello uses a quick disconnect, with main faucet valve as a sole flow control.

5,387,182 Otani uses snap on coupling which needs to be removed every time for regular faucet use, less than convenient. 5,772,616 Competiello's leak proof claim with his faucet attachment is next to impossible to achieve with most of today's faucets.

Several powered and non powered dental cleaning devices have been invented, the only dental jet widely marketed is a powered multi nozzle Teledyne's Waterpik system and next to nothing on the non powered version, for most part being impractical, inconvenient or cumbersome in design. My present invention contains none of the disadvantages of the prior art. Through its simplicity of design and lack of moving parts or electricity, safety and convenience are increased, while noise, cost and maintenance is reduced.

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BRIEF SUMMERY OF THE INVENTION

The object of this invention is to create a new multi user water pressure driven oral cleansing device , DentalJet with exchangeable nozzle / handle which is easy to use, uses no electricity, easy and inexpensive to manufacture, therefore inexpensive at the retail level.

This invention creates a more convenient way to maintain dental hygiene just by rotating a diverter, it turns a faucet into an inexhaustible water source for the DentalJet. It can be manufactured with few components, easy to maintain, uses domestic water supply under pressure filter in the diverter to prevent any jet-tip clogging, rotating diverter also works as a fine water volume control with preset water temperature.

The object of this invention is to provide a new and convenient way to exchange nozzles for the different family members by using a pressurized flexible hose adapter with an expendable rubber tubing inside the handle. Water flows under the flexible tubing, expending it, than water leaves at the jet-tip as tubing deflates, pressure builds up again expanding it, creating a pulsating jet stream and the bulged-up expended adapter keeps the adapter water tight inside the handle.

Color coded jet-tip / handle can be replaced when water pressure is removed by turning the diverter in the regular straight direction, deflated rubber tubing allows an easy exchange by sliding the "interchangeable hose assembly" in and out.

The footprint of this DentalJet is very small, the handle holder is attached to the diverter, needs no extra counter space which is very important in small bathrooms, needs no electricity.

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BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Sheet 1 FIG 1 of shows a typical faucet spout 1A, 1B and 1C is a special filter/washer (29) with a fine plastic filtering mash on top and bottom with felt in the center, 2A shows a basic prior art diverter (2) with a DentalJet holder (3) on the side, 2B the DentalJet holder. FIG 3 shows the DentalJet diverter in normal position with compression fitting and tube with DentalJet holder (3).

Sheet 2 FIG 4 shows the interchangeable hose assembly, a flexible PVC tube (10) tightly fits on the stainless steel barbed connector (14) held together with single clamp (18). On one end the expendable rubber hose (16) on the other end, water under pressure enters at (19), exits at (20) and under flexible rubber hose (16) trough hole (15). Rubber tubing (16) expands and collapses based on water flow volume, creating a pulsating effect and keeps the hose assembly inside the handle (13) as it bulges up. FIG 5 shows the “interchangeable hose assembly” with a single wide clamp (26) under water pressure, flexible rubber tube (16) is in the inflated position.

FIG 6 shows the hose assembly in the inflated position inside the handle (13), inside diameter of handle is enlarged (17) to accommodate the inflated rubber hose to keep the assembly inside the handle (13). Sheet 3 FIG 7 shows the side view of the DentalJet with dual single clamps

FIG 8 side view shows the hose assembly inside a closable hosing by cap (27)

FIG 9 shows the rubber hose end with two clamps providing the maximum positioning inside the handle, but no pulsating effect. Jet outlet (20) is a reduced diameter flow limiter.

FIG 10 same as FIG 6 with whole nozzle (11) with maximum pulsating effect, since all the water is passing inside the flexible rubber tube (16). FIG 11 shows the side view of the case (13) and tip (11) as a sealed unit FIG 12 shows the stainless steel barbed adapter (14) molded inside the PVC tip (11) for a single user. FIG 13 shows a replaceable threaded nozzle (39) with pulsating adapter assembly / handle. Sheet 5 FIG 14 the replaceable nozzle (36) with an exterior threading, it mates with the female threading of the handle as they are interchangeable.

DETAILED DESCRIPTION OF THE INVENTION

Sheet 1 FIG 1A shows a typical faucet spout (1) with threading (21), DentalJet (13) in the holder (3), 1B and 1C is a special filter/washer (23) with rubber vulcanized to the fine plastic filtering mesh on top and on the bottom (30) with felt in the center (29) for fine particle filtering to prevent clogging up the DentalJet (13) as an improvement over prior arts.

FIG 2A shows the diverter (2) in diverted mode supplying water via filter (30), center of diverter (32) via rotating diverter drum (39) compression type connector (5), (25), threading (4), normal flow exists through regular aerator (6) from faucet (1). Diverter is attached to the end of the faucet by captive, rotating nut (24) with inside threading (21) a DentalJet holder (3) on the side, 2B shows the DentalJet holder (3) made of plastic, preferably PVC or vinyl, it has two oval holes (33) on the side, plastic cable tie (31) is threaded through and around the diverter above the diverter knob (7) to keep the DentalJet (13) in a secure position if not in use.

FIG 3 shows the diverter (2) in normal mode with flexible PVC tube (10) which is fed through compression nut (8) in the center hole (9) over the sleeve (5) to provide a water tight connection when nut (8) is tightened, flex tube is about 20-25" long, the other end is the interchangeable hose assembly (Fig. 4, 5, 6). Diverter knob (7) in partial diversion acts as a fine volume / pressure control, and it is an improvement over prior arts as it adjusts water pressure very conveniently with one hand with pre-selected without changing water temperature.

Sheet 2 FIG 4 shows the other end of the flexible PVC hose (10) capable for compression and water tight barbed fitting at the interchangeable hose assembly, as it is tightly fitted on the stainless steel barbed connector (14) at least one inch in length. The other end of the adaptor has a flexible, expandable rubber tube (16) over the barbing area A to B attached with single clamp (18). Water flows from PVC hose (10) through the adapter (14) intake center opening (19), smaller diameter to the front end (20) also functions as a volume limiter.

The front end of the brass-barbed adapter is drilled through at location (15) to channel the water under the flexible rubber hose (16). As the water flows under pressure through opening (15) it bulges up the rubber tube (FIG 4, 5, 6) and presses against the inner wall of the DentalJet (13) at location FIG 6 (17) to keep the hose tip assembly solidly inside the handle (13).

The adapter is also referred to as “ the interchangeable hose assembly”.

Front end of adapter (14) has some “play” inside the handle to allow some water to pass through between the barbing and the rubber hose. Bulged up tube releases some water on the front when pressure is built up, partially deflates as water exists, then bulges up again, providing an oscillating, pulsating water flow effect as the water flows into the jet tip (11), sealed or glued together with the handle.

On FIG 5 and 6 the clamp (26) is dual wide for extra hose clamping ability.

Sheet 3 FIG 7 shows the complete interchangeable nozzle / handle assembly with the adapter hose assembly inserted.

FIG 8 is a preferred configuration for a single user, where the handle is threaded at the end (21) and closable by cap (27).

FIG 9 shows a non pulsating interchangeable hose adapter end where the expandable rubber tube (16) is clamped at both end by clamps (18 and 26), providing the maximum friction to hold the hose adapter inside the handle (13) as water pressure bulges up the tube through hole (15).

FIG 10 provides the maximum pulsating effect, all water passes under the flexible rubber hose (16) than to the nozzle (11). Handle inside diameter at (28) allows the water to pass through.

FIG 11 shows the integrated nozzle / handle (11,13) nozzle (12) without the hose tip assembly.

FIG 12 shows a single user DentalJet assembly where one end of the brass or stainless steel adapter (14) is molded into the jet tip (11), PVC hose (10) is barbed fitted, case is closable by threaded cap (25).

Sheet 5 of FIG 13 shows an interchangeable handle 13A with male threading at the front end (37) with an interchangeable nozzle assembly (39), nozzle (12) and inside threaded connecting end(38) capable to be attached to the handle with means of threading.

FIG 14 shows an interchangeable handle (13B) with an interchangeable nozzle adapter (36), where nozzle adapter has male threading at the end mating with the inside threading (41) of the (13B) handle, flat rubber washer (34) keeps tight water proof coupling.

In respect, after explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention, nor is it intended to be limiting as to the scope of the invention in any way.